

Residential System Sizing Calculation

Summary

Menendez Res

Project Title:
210698 Menendez Res

Lake City, FL

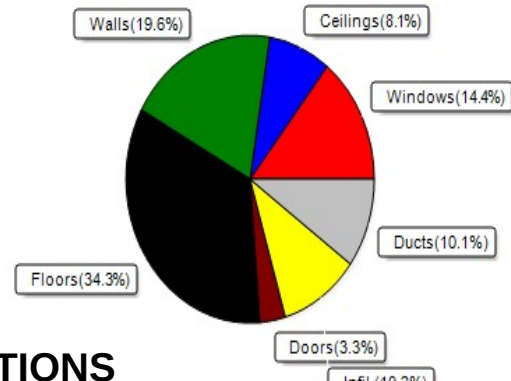
2021-05-11

Location for weather data: Gainesville, FL - Defaults: Latitude(29.7) Altitude(152 ft.) Temp Range(M)			
Humidity data: Interior RH (50%) Outdoor wet bulb (77F) Humidity difference(51gr.)			
Winter design temperature(TMY3 99%)	30 F	Summer design temperature(TMY3 99%)	94 F
Winter setpoint	70 F	Summer setpoint	75 F
Winter temperature difference	40 F	Summer temperature difference	19 F
Total heating load calculation	37792 Btuh	Total cooling load calculation	31873 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	108.5 41000	Sensible (SHR = 0.75)	114.3 30750
Heat Pump + Auxiliary(0.0kW)	108.5 41000	Latent	206.6 10250
		Total (Electric Heat Pump)	128.6 41000

WINTER CALCULATIONS

Winter Heating Load (for 2498 sqft)

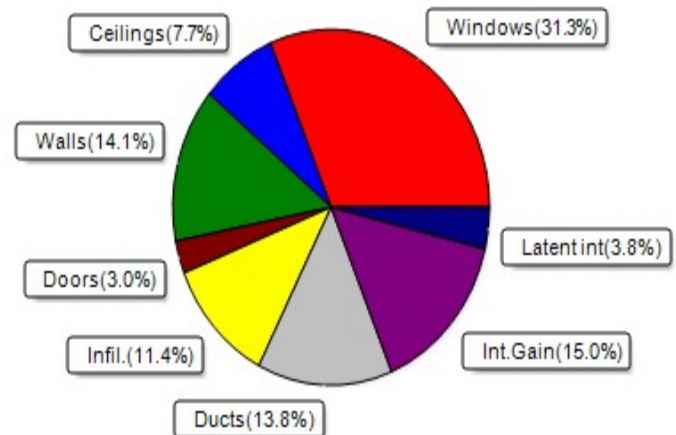
Load component		Load	
Window total	388 sqft	5437	Btuh
Wall total	2083 sqft	7395	Btuh
Door total	79 sqft	1259	Btuh
Ceiling total	2552 sqft	3075	Btuh
Floor total	2498 sqft	12980	Btuh
Infiltration	88 cfm	3845	Btuh
Duct loss		3801	Btuh
Subtotal		37792	Btuh
Ventilation	0 cfm	0	Btuh
TOTAL HEAT LOSS		37792	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 2498 sqft)

Load component		Load	
Window total	388 sqft	9966	Btuh
Wall total	2083 sqft	4488	Btuh
Door total	79 sqft	944	Btuh
Ceiling total	2552 sqft	2460	Btuh
Floor total		0	Btuh
Infiltration	66 cfm	1370	Btuh
Internal gain		4780	Btuh
Duct gain		2904	Btuh
Sens. Ventilation	0 cfm	0	Btuh
Blower Load		0	Btuh
Total sensible gain		26913	Btuh
Latent gain(ducts)		1487	Btuh
Latent gain(infiltration)		2273	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		1200	Btuh
Total latent gain		4960	Btuh
TOTAL HEAT GAIN		31873	Btuh



8th Edition

EnergyGauge® System Sizing
PREPARED BY: **Evan Beamsley**
DATE: **2021-05-11**

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Menendez Res

Project Title:
210698 Menendez Res
Building Type: User

Lake City, FL

2021-05-11

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 40.0 F (TMY3 99%)
This calculation is for Worst Case. The house has been rotated 270 degrees.

Component Loads for Whole House

Window	Panes/Type	Frame	U	Orientation	Area(sqft)	X	HTM=	Load
1	2, NFRC 0.25	Metal	0.35	W	30.0		14.0	420 Btuh
2	2, NFRC 0.25	Metal	0.35	W	112.0		14.0	1568 Btuh
3	2, NFRC 0.25	Metal	0.35	W	16.0		14.0	224 Btuh
4	2, NFRC 0.25	Metal	0.35	W	36.0		14.0	504 Btuh
5	2, NFRC 0.25	Metal	0.35	W	36.0		14.0	504 Btuh
6	2, NFRC 0.25	Metal	0.35	N	16.0		14.0	224 Btuh
7	2, NFRC 0.25	Metal	0.35	E	15.0		14.0	210 Btuh
8	2, NFRC 0.25	Metal	0.35	E	60.0		14.0	840 Btuh
9	2, NFRC 0.25	Metal	0.35	E	13.3		14.0	187 Btuh
10	2, NFRC 0.25	Metal	0.35	E	5.0		14.0	70 Btuh
11	2, NFRC 0.25	Metal	0.35	E	15.0		14.0	210 Btuh
12	2, NFRC 0.25	Metal	0.35	S	30.0		14.0	420 Btuh
13	2, NFRC 0.25	Metal	0.35	S	4.0		14.0	56 Btuh
Window Total					388.3(sqft)			5437 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	105		3.55	373 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	110		3.55	391 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	26		3.55	91 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	30		3.55	107 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	158		3.55	561 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	120		3.55	426 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	166		3.55	588 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	206		3.55	731 Btuh
9	Frame - Wood	- Adj	(0.089)	13.0/0.0	191		3.55	679 Btuh
10	Frame - Wood	- Adj	(0.089)	13.0/0.0	27		3.55	96 Btuh
11	Frame - Wood	- Adj	(0.089)	13.0/0.0	30		3.55	105 Btuh
12	Frame - Wood	- Adj	(0.089)	13.0/0.0	144		3.55	512 Btuh
13	Frame - Wood	- Ext	(0.089)	13.0/0.0	57		3.55	202 Btuh
14	Frame - Wood	- Ext	(0.089)	13.0/0.0	14		3.55	48 Btuh
15	Frame - Wood	- Ext	(0.089)	13.0/0.0	233		3.55	827 Btuh
16	Frame - Wood	- Ext	(0.089)	13.0/0.0	14		3.55	48 Btuh
17	Frame - Wood	- Ext	(0.089)	13.0/0.0	116		3.55	410 Btuh
18	Frame - Wood	- Ext	(0.089)	13.0/0.0	338		3.55	1200 Btuh
Wall Total					2083(sqft)			7395 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior, n		(0.400)		32		16.0	512 Btuh
2	Insulated - Garage, n		(0.400)		20		16.0	320 Btuh
3	Insulated - Garage, n		(0.400)		20		16.0	320 Btuh
4	Insulated - Exterior, n		(0.400)		7		16.0	107 Btuh
Door Total					79(sqft)			1259Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Menendez Res
Lake City, FL

Project Title:
210698 Menendez Res
Building Type: User

2021-05-11

Ceilings 1	Type/Color/Surface Unvent Attic/D/Shing Ceiling Total	Ueff. (0.241)	R-Value 0.0/22.0	Area X 2552 2552(sqft)	HTM= 1.2	Load 3075 Btuh 3075Btuh
Floors 1	Type Slab On Grade Floor Total	Ueff. (1.180)	R-Value 0.0	Size X 275.0 ft(perim.) 2498 sqft	HTM= 47.2	Load 12980 Btuh 12980 Btuh
	Envelope Subtotal:					30146 Btuh
Infiltration	Type Natural	Wholehouse ACH 0.23	Volume(cuft) 22782	Wall Ratio 1.00	CFM= 87.8	3845 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.112)					3801 Btuh
All Zones	Sensible Subtotal All Zones					37792 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	37792 Btuh 0 Btuh 37792 Btuh
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EQUIPMENT

1. Electric Heat Pump	#	41000 Btuh
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Key: Window types - NFRC (Requires U-Factor and Shading coefficient(SHGC) of glass as numerical values)
or - Glass as 'Clear' or 'Tint' (Uses U-Factor and SHGC defaults)
U - (Window U-Factor)
HTM - (ManualJ Heat Transfer Multiplier)



Version 8

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Menendez Res

Project Title:
210698 Menendez Res

Lake City, FL

2021-05-11

Reference City: Gainesville, FL

Temperature Difference: 19.0F(TMY3 99%)

Humidity difference: 51gr.

This calculation is for Worst Case. The house has been rotated 270 degrees.

Component Loads for Whole House

Window	Type*					Overhang		Window Area(sqft)			HTM		Load		
	Panes	SHGC	U	InSh	IS Ornt	Len	Hgt	Gross	Shaded	Unshaded	Shaded	Unshaded			
1	2 NFRC	0.25, 0.35	No	No	W	1.5ft	1.5ft	30.0	0.0	30.0	12	31	923	Btuh	
2	2 NFRC	0.25, 0.35	No	No	W	13.8f	0.5ft	112.0	112.0	0.0	12	31	1334	Btuh	
3	2 NFRC	0.25, 0.35	No	No	W	10.3f	1.5ft	16.0	16.0	0.0	12	31	191	Btuh	
4	2 NFRC	0.25, 0.35	No	No	W	1.5ft	1.5ft	36.0	0.0	36.0	12	31	1107	Btuh	
5	2 NFRC	0.25, 0.35	No	No	W	1.5ft	1.5ft	36.0	0.0	36.0	12	31	1107	Btuh	
6	2 NFRC	0.25, 0.35	No	No	N	1.5ft	1.5ft	16.0	0.0	16.0	12	12	191	Btuh	
7	2 NFRC	0.25, 0.35	No	No	E	1.5ft	1.5ft	15.0	0.0	15.0	12	31	461	Btuh	
8	2 NFRC	0.25, 0.35	No	No	E	9.5ft	0.5ft	60.0	60.0	0.0	12	31	715	Btuh	
9	2 NFRC	0.25, 0.35	No	No	E	9.5ft	0.5ft	13.3	13.3	0.0	12	31	159	Btuh	
10	2 NFRC	0.25, 0.35	No	No	E	9.5ft	0.0ft	5.0	5.0	0.0	12	31	60	Btuh	
11	2 NFRC	0.25, 0.35	No	No	E	1.5ft	1.5ft	15.0	0.0	15.0	12	31	461	Btuh	
12	2 NFRC	0.25, 0.35	No	No	S	1.5ft	1.5ft	30.0	30.0	0.0	12	14	357	Btuh	
13	2 NFRC	0.25, 0.35	No	No	S	1.5ft	1.5ft	4.0	4.0	0.0	12	14	48	Btuh	
Excursion													2855	Btuh	
Window Total								388 (sqft)					9966	Btuh	
Walls	Type					U-Value		R-Value		Area(sqft)		HTM		Load	
								Cav/Sheath							
1	Frame - Wood - Ext					0.09		13.0/0.0		105.0	2.3		238	Btuh	
2	Frame - Wood - Ext					0.09		13.0/0.0		110.3	2.3		250	Btuh	
3	Frame - Wood - Ext					0.09		13.0/0.0		25.5	2.3		58	Btuh	
4	Frame - Wood - Ext					0.09		13.0/0.0		30.0	2.3		68	Btuh	
5	Frame - Wood - Ext					0.09		13.0/0.0		158.0	2.3		358	Btuh	
6	Frame - Wood - Ext					0.09		13.0/0.0		120.0	2.3		272	Btuh	
7	Frame - Wood - Ext					0.09		13.0/0.0		165.8	2.3		375	Btuh	
8	Frame - Wood - Ext					0.09		13.0/0.0		206.0	2.3		466	Btuh	
9	Frame - Wood - Adj					0.09		13.0/0.0		191.3	1.7		323	Btuh	
10	Frame - Wood - Adj					0.09		13.0/0.0		27.0	1.7		46	Btuh	
11	Frame - Wood - Adj					0.09		13.0/0.0		29.5	1.7		50	Btuh	
12	Frame - Wood - Adj					0.09		13.0/0.0		144.3	1.7		243	Btuh	
13	Frame - Wood - Ext					0.09		13.0/0.0		57.0	2.3		129	Btuh	
14	Frame - Wood - Ext					0.09		13.0/0.0		13.5	2.3		31	Btuh	
15	Frame - Wood - Ext					0.09		13.0/0.0		233.0	2.3		527	Btuh	
16	Frame - Wood - Ext					0.09		13.0/0.0		13.5	2.3		31	Btuh	
17	Frame - Wood - Ext					0.09		13.0/0.0		115.5	2.3		261	Btuh	
18	Frame - Wood - Ext					0.09		13.0/0.0		338.0	2.3		765	Btuh	
Wall Total								2083 (sqft)					4488	Btuh	
Doors	Type									Area (sqft)		HTM		Load	
1	Insulated - Exterior									32.0	12.0		384	Btuh	
2	Insulated - Garage									20.0	12.0		240	Btuh	
3	Insulated - Garage									20.0	12.0		240	Btuh	
4	Insulated - Exterior									6.7	12.0		80	Btuh	
Door Total								79 (sqft)					944	Btuh	
Ceilings	Type/Color/Surface					U-Value		R-Value		Area(sqft)		HTM		Load	
1	Unvented Attic/DarkShingle					0.241		0.0/22.0		2552.0	0.96		2460	Btuh	
Ceiling Total								2552 (sqft)					2460	Btuh	
Floors	Type							R-Value		Size		HTM		Load	
1	Slab On Grade							0.0		2498 (ft-perimeter)	0.0		0	Btuh	
Floor Total								2498.0 (sqft)					0	Btuh	

Manual J Summer Calculations

Residential Load - Component Details (continued)

Menendez Res

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
210698 Menendez Res

Lake City, FL

2021-05-11

	Envelope Subtotal:					17859 Btuh
Infiltration	Type	Average ACH	Volume(cuft)	Wall Ratio	CFM=	Load
	Natural	0.17	22782	1	65.9	1370 Btuh
Internal gain		Occupants	Btuh/occupant		Appliance	Load
		6	X 230	+	3400	4780 Btuh
	Sensible Envelope Load:					24009 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic) (DGM of 0.121)					2904 Btuh
	Sensible Load All Zones					26913 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Menendez Res

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
210698 Menendez Res

Lake City, FL

2021-05-11

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	24009 Btuh
	Sensible Duct Load	2904 Btuh
	Total Sensible Zone Loads	26913 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	26913 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	2273 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1487 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	4960 Btuh
	TOTAL GAIN	31873 Btuh

EQUIPMENT

1. Central Unit	#	41000 Btuh
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*Key: Window types (Panels - Number and type of panes of glass)

(SHGC - Shading coefficient of glass as SHGC numerical value)

(U - Window U-Factor)

(InSh - Interior shading device: none(No), Blinds(B), Draperies(D) or Roller Shades(R))

- For Blinds: Assume medium color, half closed

For Draperies: Assume medium weave, half closed

For Roller shades: Assume translucent, half closed

(IS - Insect screen: none(N), Full(F) or Half(½))

(Ornt - compass orientation)



Version 8